

REMARKS

In the non-final Office Action, the Examiner rejected claims 1-31 under 35 U.S.C. § 102(e) as anticipated by Smith (U.S. Patent No. 6,629,178).

By this Amendment, Applicant amends claims 1-8, 17-23, and 27 to improve form. Applicant traverses the Examiner's rejection under 35 U.S.C. § 102 with regard to the claims as now amended. Claims 1-31 remain pending.

In paragraph 2 of the Office Action, the Examiner rejected claims 1-31 as allegedly anticipated by Smith. Applicant respectfully traverses the rejection.

Amended claim 1, for example, recites a combination of features of a system for selecting bus mastership in a multi-master system. The system includes a plurality of master devices and a plurality of slave devices connected to the master devices via a bus. The master devices are configured to generate control signals relating to control of the bus in the multi-master system. Each of the slave devices is configured to receive the control signals from the master devices, determine whether a conflict exists based on the control signals, generate one or more alternate control signals for selecting bus mastership when a conflict is determined to exist, and determine which of the master devices obtains control of the bus using the one or more alternate control signals when a conflict is determined to exist.

A proper rejection under 35 U.S.C. § 102 requires that a single reference teach every aspect of the claimed invention either expressly or impliedly. Any feature not directly taught must be inherently present. In other words, the identical invention must be shown in as complete detail as contained in the claim. See M.P.E.P. § 2131. Smith does not disclose or suggest the combination of features recited in amended claim 1. For example, Smith does not disclose or

suggest a plurality of slave devices connected to a plurality of master devices via a bus, where each slave device is configured to receive control signals from the master devices, determine whether a conflict exists based on the control signals, generate one or more alternate control signals for selecting bus mastership when a conflict is determined to exist, and determine which of the master devices obtains control of the bus using the one or more alternate control signals when a conflict is determined to exist.

The Examiner appears to allege that arbitration unit 252 in Smith is equivalent to the slave device recited in claim 1 (Office Action, page 2). Smith does not disclose, however, a plurality of arbitration units that, among other things, connect to a plurality of master devices via a bus and determine which of the master devices obtains control of the bus using one or more alternate control signals when a conflict is determined to exist.

For at least these reasons, Applicant submits that claim 1 is not anticipated by Smith. Claims 2-7 depend from claim 1 and are, therefore, not anticipated by Smith for at least the reasons given with regard to claim 1. Claims 2-7 are also not anticipated by Smith for reasons of their own.

For example, amended claim 4 recites that each of the slave devices comprises bus selection logic configured to determine whether the control signals indicate that none of the master devices asserts control of the bus and maintain a previous grant of control of the bus when none of the master devices asserts control of the bus. Smith does not disclose or suggest these features.

The Examiner alleged that Smith discloses these features and cited column 2, lines 18-26, of Smith for support (Office Action, page 3). Applicant disagrees.

At column 2, lines 18-26, Smith discloses:

When a high-priority bus agent requests access to the bus, the arbitration unit may cause the termination of access by the normal-priority bus agent. The high-priority bus agent may then be granted access to the bus. When the high-priority bus agent has completed its use of the bus, the arbitration unit may then allow the normal-priority bus agent (that had access just prior to the high-priority agent) to regain access to the bus.

Nowhere in this section, or elsewhere, does Smith disclose or suggest a plurality of slave devices that determine whether control signals indicate that none of the master devices asserts control of the bus.

For at least these additional reasons, Applicant submits that claim 4 is not anticipated by Smith.

Amended claim 6 recites that the control signals include a present signal that indicates whether a corresponding one of the master devices is operating and a master signal that indicates whether a corresponding one of the master devices asserts control of the bus. Smith does not disclose or suggest these features.

With regard to the present signal, the Examiner alleged that "it is inherently that there is indication whether master assert bus mastership include a present signal that indicates master is operating" (Office Action, page 4). Applicant disagrees. According to M.P.E.P. § 2112,

To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'

(quoting In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)). The Examiner has not met the requisite burden of proof for establishing inherency. Instead, the Examiner made a mere allegation that the present signal is inherent. Smith does not disclose or

suggest, however, a present signal that indicates whether a corresponding master device is operating.

For at least these additional reasons, Applicant submits that claim 6 is not anticipated by Smith.

Amended independent claim 8 recites a combination of features of a system for selecting a master in a multi-master system. The system includes means for outputting first and second control signals relating to mastership in the multi-master system from each of a plurality of masters in the multi-master system, means for determining whether a conflict for mastership exists based on the first and second control signals, means for generating a switch signal and a select signal when a conflict is determined to exist, and means for selecting one of the masters using the switch signal and the select signal.

Smith does not disclose or suggest the combination of features recited in claim 8. For example, Smith does not disclose or suggest means for outputting first and second control signals relating to mastership in the multi-master system from each of a plurality of masters in the multi-master system. Instead, Smith discloses that each of bus agents 250 transmits only a bus request signal to request access to the bus (col. 5, lines 22-25; Fig. 3A).

For at least these reasons Applicant submits that claim 8 is not anticipated by Smith.

Independent claim 9 recites a combination of features of a method for selecting a bus in a multi-bus system. The method includes generating control signals relating to bus selection in the multi-bus system, determining whether a conflict for bus selection exists based on the control signals, generating one or more alternate control signals when a conflict is determined to exist, and selecting a bus using the one or more alternate control signals.

Smith does not disclose or suggest the combination of features recited in claim 9. For example, Smith does not disclose generating control signals relating to bus selection in a multi-bus system. Instead, Smith discloses a group of bus agents 250 that share access to a single bus (Fig. 2; col. 5, lines 21-51).

Because Smith does not disclose bus selection in a multi-bus system, Smith cannot disclose determining whether a conflict for bus selection exists based on the control signals, generating one or more alternate control signals when a conflict is determined to exist, or selecting a bus using the one or more alternate control signals.

The Examiner did not address each of the features of claim 9 and, therefore, did not establish a proper case of anticipation with regard to claim 9.

For at least these reasons, Applicant submits that claim 9 is not anticipated by Smith. Claims 10-16 depend from claim 9 and are, therefore, not anticipated by Smith for at least the reasons given with regard to claim 9. Claims 10-16 also recite other features relating to bus selection in a multi-bus system. Smith does not disclose or suggest the features of claims 10-16. Applicant also notes that the Examiner did not particularly address claim 10 and, therefore, did not establish a proper case of anticipation with regard to claim 10.

Amended independent claim 17 recites features similar to features described above with regard to claim 8. Claim 17 is, therefore, not anticipated by Smith for reasons similar to the reasons given with regard to claim 8.

Amended independent claim 18 recites a combination of features in a multi-master system comprising a plurality of master devices connected to a plurality of slave devices. Each of the slave devices includes selection logic configured to determine whether control signals

from the master devices indicate that two or more of the master devices concurrently assert mastership within the multi-master system, generate a conflict indication signal when two or more of the master devices concurrently assert mastership, and select mastership using one or more alternate control signals when two or more of the master devices concurrently assert mastership, and conflict resolution logic configured to generate the one or more alternate control signals to identify mastership in response to the conflict indication signal.

Smith does not disclose or suggest the combination of features recited in claim 18. For example, Smith does not disclose or suggest a plurality of slave devices, which are connected to a plurality of master devices, that each comprises selection logic and conflict resolution logic.

The Examiner appears to allege that arbitration unit 252 in Smith is equivalent to a slave device recited in claim 18 (Office Action, page 2). Smith does not disclose, however, a plurality of arbitration units that, among other things, connect to a plurality of master devices and select mastership using one or more alternate control signals when two or more of the master devices concurrently assert mastership, as required by claim 18.

For at least these reasons, Applicant submits that claim 18 is not anticipated by Smith. Claims 19-22 depend from claim 18 and are, therefore, not anticipated by Smith for at least the reasons given with regard to claim 18. Claims 19-22 also recite features similar to the features described above with regard to claims 2-7. Claims 19-22 are, therefore, also not anticipated by Smith for reasons similar to the reasons given with regard to claims 2-7.

Amended independent claim 23 recites a combination of features of a method for selecting bus mastership in a multi-master system comprising a plurality of master devices connected to a plurality of slave devices via at least one bus. The method, which is performed by

each of the slave devices, comprises determining whether control signals from the master devices indicate that two or more of the master devices concurrently assert bus mastership, generating one or more alternate control signals to identify which of the master devices obtains bus mastership when two or more of the master devices concurrently assert bus mastership, determining which of the master devices obtains bus mastership using the one or more alternate control signals when two or more of the master devices concurrently assert bus mastership, and determining which of the master devices obtains bus mastership using the control signals when one of the master devices asserts bus mastership.

Smith does not disclose or suggest the combination of features recited in claim 23. For example, Smith does not disclose or suggest a plurality of slave devices connected to a plurality of master devices via at least one bus, where each of the slave devices determines whether control signals from the master devices indicate that two or more of the master devices concurrently assert bus mastership, generates one or more alternate control signals to identify which of the master devices obtains bus mastership when two or more of the master devices concurrently assert bus mastership, determines which of the master devices obtains bus mastership using the one or more alternate control signals when two or more of the master devices concurrently assert bus mastership, and determines which of the master devices obtains bus mastership using the control signals when one of the master devices asserts bus mastership.

The Examiner appears to allege that arbitration unit 252 in Smith is equivalent to a slave device recited in claim 23 (Office Action, page 2). Smith does not disclose, however, a plurality of arbitration units that, among other things, connect to a plurality of master devices, determine which of the master devices obtains bus mastership using one or more alternate control signals

when two or more of the master devices concurrently assert bus mastership, and determine which of the master devices obtains bus mastership using control signals when one of the master devices asserts bus mastership, as required by claim 23.

For at least these reasons, Applicant submits that claim 23 is not anticipated by Smith. Claims 24-26 depend from claim 23 and are, therefore, not anticipated by Smith for at least the reasons given with regard to claim 23. Claims 24-26 also recite features similar to the features described above with regard to claims 2-7. Claims 24-26 are, therefore, also not anticipated by Smith for reasons similar to the reasons given with regard to claims 2-7.

Amended independent claim 27 recites a combination of features of a multi-master system that comprises a plurality of master devices, conflict resolution logic, and a plurality of slave devices. The master devices are configured to generate control signals relating to bus mastership. The conflict resolution logic is configured to receive the control signals from the master devices, determine whether the control signals indicate that two or more of the master devices concurrently assert bus mastership, and generate a switch signal and a select signal when it is determined that two or more of the master devices concurrently assert bus mastership. The slave devices are configured to select bus mastership using the switch signal and the select signal when the control signals indicate that two or more of the master devices concurrently assert bus mastership.

Smith does not disclose or suggest the combination of features recited in claim 27. For example, Smith does not disclose or suggest a plurality of slave devices that are configured to select bus mastership using a switch signal and a select signal when the control signals indicate that two or more of the master devices concurrently assert bus mastership. The Examiner did not

address the feature of a plurality of slave devices that are configured to select bus mastership.

Therefore, the Examiner did not establish a proper case of anticipation with regard to claim 27.

For at least these reasons, Applicant submits that claim 27 is not anticipated by Smith.

Independent claim 28 recites a combination of features of a multi-bus system. The system includes a plurality of buses; a plurality of master devices corresponding to the buses, each of the master devices controlling a corresponding one of the buses, the master devices generating control signals that indicate which of the buses is an active bus; and a plurality of slave devices connected to each of the buses and configured to receive the control signals, determine whether the control signals indicate that two or more of the buses are declared active buses, and select one of the buses when the control signals indicate that two or more of the buses are declared active buses.

Smith does not disclose or suggest the combination of features recited in claim 28. For example, Smith does not disclose or suggest a plurality of master devices that generate control signals that indicate which of the buses is an active bus. Smith does not disclose anything relating to identification of an active bus.

The Examiner alleged that Smith discloses this feature and cited column 2, lines 7-41, and column 5, lines 21-51, of Smith for support (Office Action, page 5). Applicant disagrees.

At column 2, lines 7-41, Smith discloses:

The problems outlined above may in large part be solved by a system and method for bus arbitration. In one embodiment, a computer system includes one or more buses for transferring data. Access to each bus may be controlled by an arbitration unit and a bus interface unit. In addition to a processor, various bus agents (i.e. peripherals) may also be coupled to the bus. Some bus agents may be designated as normal-priority agents, while other bus agents may be designated as high-priority bus agents. A high-priority bus agent may be a peripheral that is a latency-sensitive device. The arbitration unit may grant bus

access to a normal-priority bus agent based on an arbitration scheme. When a high-priority bus agent requests access to the bus, the arbitration unit may cause the termination of access by the normal-priority bus agent. The high-priority bus agent may then be granted access to the bus. When the high-priority bus agent has completed its use of the bus, the arbitration unit may then allow the normal-priority bus agent (that had access just prior to the high-priority agent) to regain access to the bus.

In one embodiment, an arbitration unit may be configured to receive bus request signals from each of a plurality of bus agents coupled to the bus. The arbitration unit may be configured to distinguish between a bus request signal received from a normal-priority bus agent and one received from a high-priority bus agent. After receiving a bus request signal from a high-priority bus agent, the arbitration unit may assert a bus disconnect signal. The bus disconnect signal may be received by the bus interface unit. The bus interface unit may terminate access to the bus by the normal-priority bus agent, while the arbitration unit may assert a bus grant signal to be received by the high-priority bus agent. Responsive to receiving the bus grant signal, the high-priority bus agent may begin transmitting or receiving data across the bus.

Nowhere in this section, or elsewhere, does Smith disclose or suggest a master device that generates a control signal that indicates which of a plurality of buses is an active bus. If this rejection is maintained, Applicant respectfully requests that the Examiner specifically point out where in this section of Smith this feature is disclosed.

At column 5, lines 21-51, Smith discloses:

Arbitration unit 252 is configured to arbitrate access to bus 214 for bus agents 250. Arbitration unit 252 is coupled to receive bus request signals from each of bus agents 250, each indicating a request, or lack thereof, for bus access by its associated agent. Arbitration unit 252 may grant access to any one of bus agents 250 by asserting a bus grant signal to that particular bus agent. In one embodiment, the bus grant signal may stay asserted until the bus agent 250 has completed data transfers. In this embodiment, arbitration unit 252 may terminate bus access to a specific agent by de-asserting the bus grant signal. Alternate embodiments, wherein an arbitration unit may drive a "stop" signal to each bus agent coupled to the bus, are possible and contemplated.

For normal-priority bus agents 250N, arbitration unit 252 may decide which bus agent is granted the next access (i.e. which agent becomes the "bus master") based on an arbitration scheme. One possible arbitration scheme may grant access to the bus based on the order in which the requests were received, i.e. "first-come, first-served". Another possible arbitration scheme may be a "round-robin" scheme, wherein arbitration unit 252 may poll each of the normal-priority bus agents 250N, and granting access to a particular bus agent if it has a pending request. In general, a variety of possible arbitration schemes exist, any of which may be used by arbitration unit 252 to grant bus access to one of

normal-priority bus agents 250N. If high-priority bus agent 250H requests bus access, arbitration unit 252 may cause bus unit 251-A to terminate bus mastership from any normal-priority bus agent 250N, and grant bus access to the requesting high-priority bus agent 250H.

Nowhere in this section, or elsewhere, does Smith disclose or suggest a master device that generates a control signal that indicates which of a plurality of buses is an active bus. If this rejection is maintained, Applicant respectfully requests that the Examiner specifically point out where in this section of Smith this feature is disclosed.

Smith also does not disclose or suggest a plurality of slave devices connected to each of the buses and configured to receive the control signals, determine whether the control signals indicate that two or more of the buses are declared active buses, and select one of the buses when the control signals indicate that two or more of the buses are declared active buses.

The Examiner alleged that Smith discloses slave devices and cited column 3, lines 34-53, and column 5, lines 21-51, of Smith for support (Office Action, page 5). Applicant disagrees.

At column 3, lines 34-53, Smith discloses:

Bus bridge 202 provides an interface between processor 10, main memory 204, graphics controller 208, and devices attached to PCI bus 214. When an operation is received from one of the devices connected to bus bridge 202, bus bridge 202 identifies the target of the operation (e.g. a particular device or, in the case of PCI bus 214, that the target is on PCI bus 214). Bus bridge 202 routes the operation to the targeted device. Bus bridge 202 generally translates an operation from the protocol used by the source device or bus to the protocol used by the target device or bus.

In addition to providing an interface to an ISA/EISA bus for PCI bus 214, secondary bus bridge 216 may further incorporate additional functionality, as desired. An input/output controller (not shown), either external from or integrated with secondary bus bridge 216, may also be included within computer system 200 to provide operational support for a keyboard and mouse 222 and for various serial and parallel ports, as desired. An external cache unit (not shown) may further be coupled to CPU bus 224 between processor 10 and bus bridge 202 in other embodiments.

Nowhere in this section, or elsewhere, does Smith disclose or suggest a plurality of slave devices that determine whether the control signals indicate that two or more of the buses are declared active buses or select one of the buses when the control signals indicated that two or more of the buses are declared active buses. If this rejection is maintained, Applicant respectfully requests that the Examiner specifically point out where in this section of Smith this feature is disclosed.

Column 5, lines 21-51, of Smith has been reproduced above. Nowhere in this section, or elsewhere, does Smith disclose or suggest a plurality of slave devices that determine whether the control signals indicate that two or more of the buses are declared active buses or select one of the buses when the control signals indicated that two or more of the buses are declared active buses. In fact, Smith discloses nothing regarding the selection of a bus.

For at least these reasons, Applicant submits that claim 28 is not anticipated by Smith. Claims 29-31 depend from claim 28 and are, therefore, not anticipated by Smith for at least the reasons given with regard to claim 28. Claims 29-31 also recite other features relating to selection of a bus in a multi-bus system. Smith does not disclose or suggest the features of claims 29-31.

In view of the foregoing amendments and remarks, Applicant respectfully requests the Examiner's reconsideration of the application and the timely allowance of pending claims 1-31.

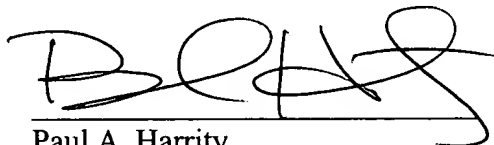
If the Examiner does not believe that all pending claims are now in condition for allowance, the Examiner is urged to contact the undersigned to expedite prosecution of this application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

including extension of time fees, to Deposit Account No. 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

HARRITY & SNYDER, L.L.P.

A handwritten signature in black ink, appearing to read 'Paul A. Harrity', written over a horizontal line.

Paul A. Harrity
Reg. No. 39,574

Date: 3/18/2004

11240 Waples Mill Road
Suite 300
Fairfax, Virginia 22030
(571) 432-0800